

ABSTRACT OF THE DISCLOSURE

A method of ruthenium layer formation for high aspect ratios, interconnect features is described. The ruthenium layer is formed using a cyclical deposition process. The invention generally provides a method of forming a film on a substrate surface including positioning a substrate within a process chamber, exposing a ruthenium-containing compound to the substrate surface, purging the process chamber with a purge gas, reducing the ruthenium-containing compound with a reductant to form a ruthenium layer on the substrate surface and purging the process chamber with the purge gas. The ruthenium-containing compound is selected from the group consisting of bis(dialkylpentadienyl)ruthenium compounds, bis(alkylpentadienyl) ruthenium compounds, bis(pentadienyl)ruthenium compounds, and combinations thereof.